

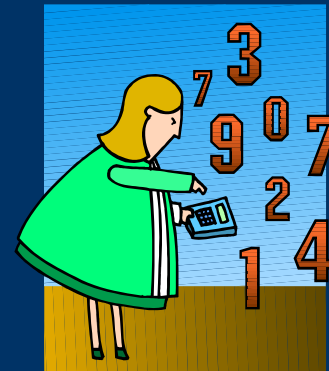
Herbaceous Ornamentals



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Today's Discussion

- ◆ **Statistics**
- ◆ **Annuals**
- ◆ **Biennials**
- ◆ **Perennials**
- ◆ **Bulbs**



Local Aspect



◆ **Fast-growing segment of ag**

- **10% increase 1998-2009**
- **everybody lives and works among plants**
 - **whether or not they realize it**

◆ **Importance to Wyoming**

- **~\$100 million green industry contribution to economy annually**
- **hidden industry**
- **not well understood**

Importance to Wyoming

◆ According to the USDA National Ag Statistics Service 2007

– annuals

- 15 operations
- \$1,564,000

– perennials

- 14 operations
- \$291,000

– cuts

- 2
- \$0 reported

– potted flowering plants

- 7 operations
- \$219,000

– Foliage

- 3 operations
- \$0 reported

– gh-produced food crops

- 4 operations
- \$71,000 reported

Importance to Wyoming

USDA National Ag Statistics Service 2012

◆ https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Rankings_of_Market_Value/Wyoming/

- Nursery, greenhouse, floriculture, and sod
 - 92 farms
 - \$8,083,000
 - 0.5% of total
- Vegetables, melons, potatoes
 - 55 farms
 - \$3,246,000
 - 0.2% of total

Importance to Region

State	Ann.	Per.	Potted	Fol.	Food	Cut
WY	15 \$1.6m	14 \$291k	7 \$219k	3 \$0	4 \$71k	2 \$0
CO	100 \$71m	98 \$20m	44 \$6.6m	10 \$609k	15 \$4m	13 \$1.7m
CA	236 \$205m	230 \$67m	257 \$219m	199 \$109m	105 \$178m	314 \$273m
UT	65 \$28m	47 \$6.7m	35 \$16m	14 \$964k	4 \$728k	1 \$0

What's Included?



◆ **Annuals**

- **bedding plants**
- **vegetable transplants**

◆ **Perennials**

- **flowering**
- **ornamental grasses**

◆ **Potted flowering plants**

- **holiday crops**
- **often seasonal**

◆ **Fresh cut flowers**

- **holiday**
- **ready-made**

◆ **Foliage**

- **interior**
- **house**

◆ **Food crops**

- **herbs**
- **vegetables**

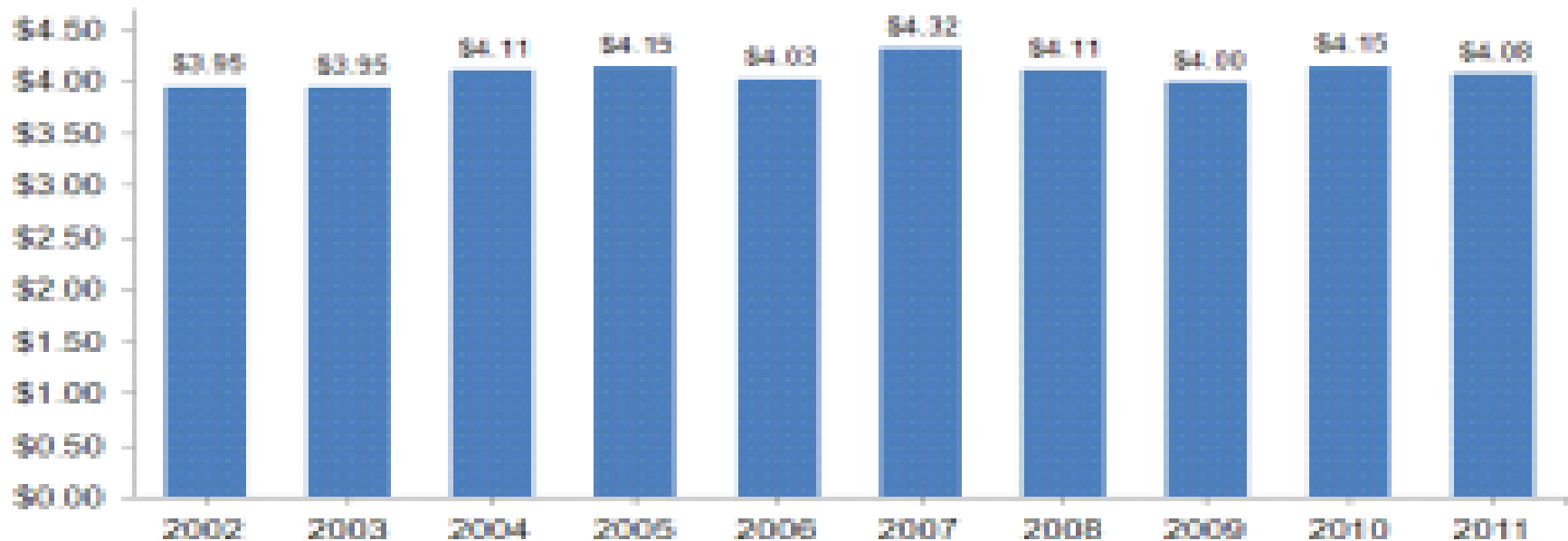
NASS

- 
- ◆ https://www.nass.usda.gov/Charts_and_Maps/Floriculture_Crops/

Floriculture Census – 2011 Summary

Expanded Wholesale Value, Operations with \$10,000+ Sales – 15-States

Billion dollars



Floriculture Census – 2014 Summary

Expanded Wholesale Value, Operations with \$10,000+ Sales – 15-States

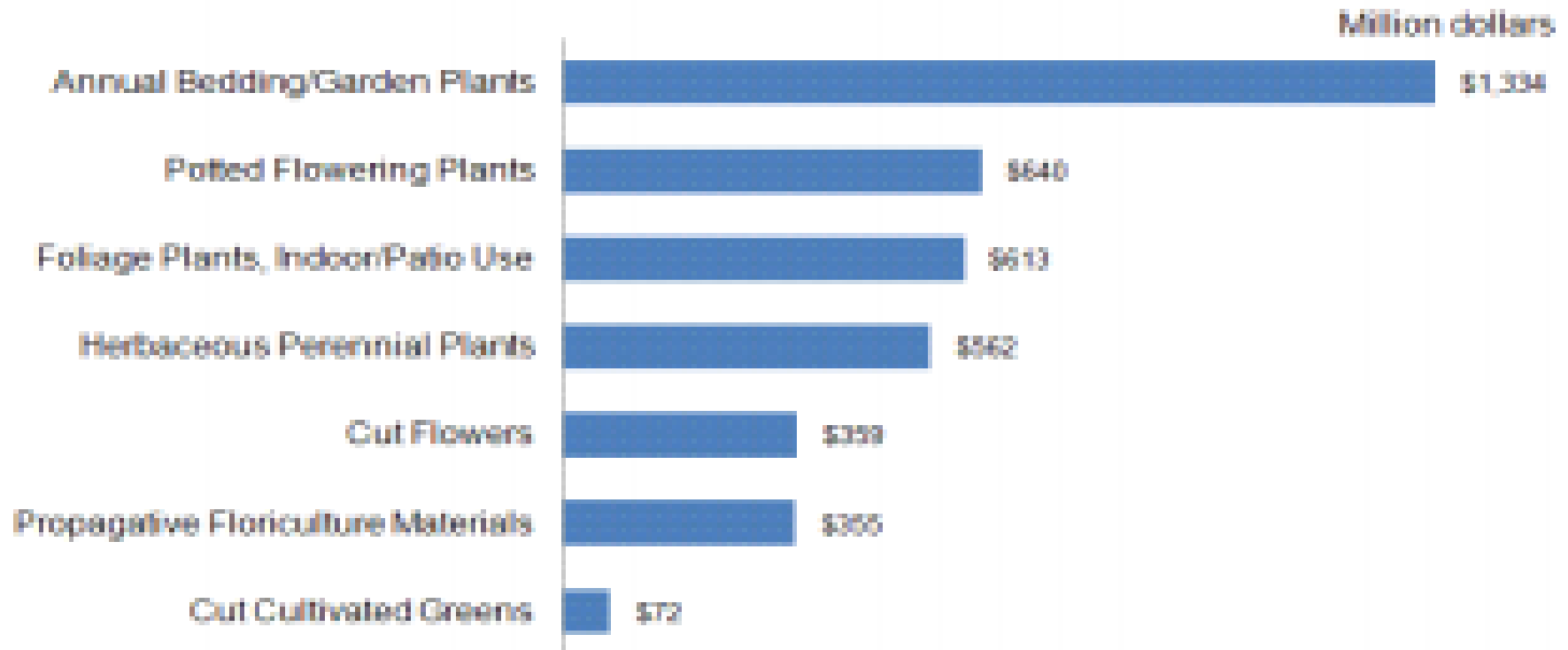
Billion dollars



USDA-NASS
June 2014

Floriculture Census – 2011 Summary

Wholesale Value of Sales by Plant Category, Operations with \$100,000+ Sales – 15-States: 2011

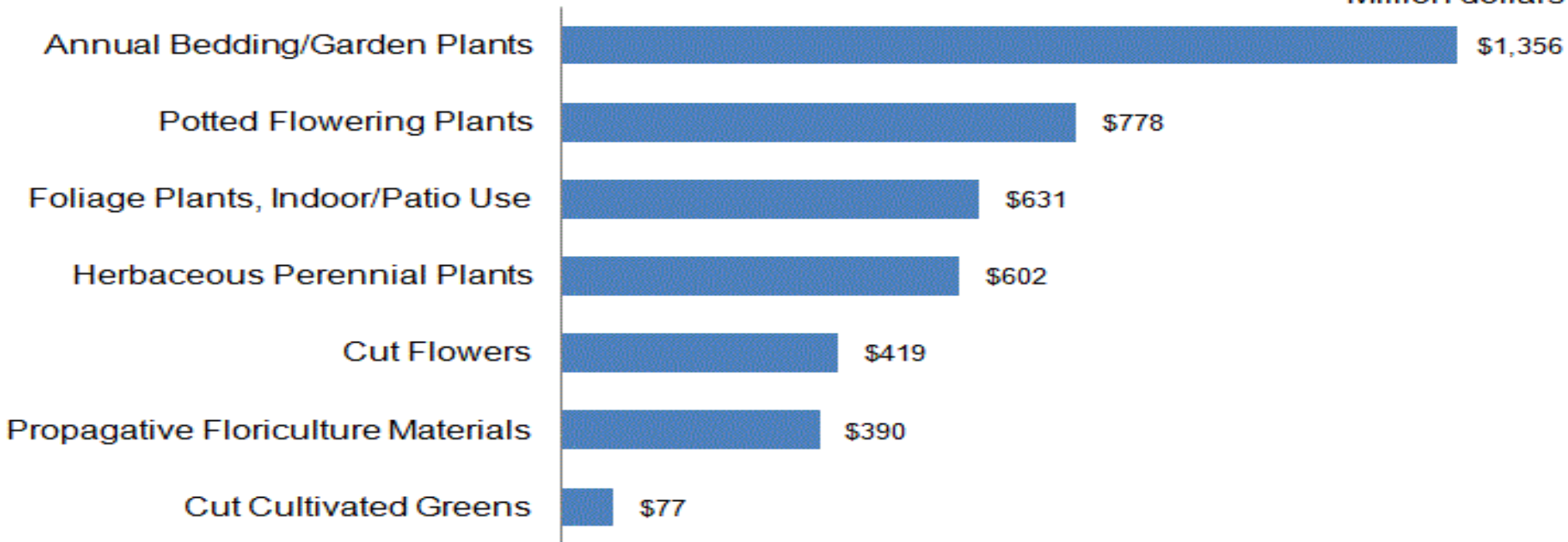


Floriculture Census – 2014 Summary



Wholesale Value of Sales by Plant Category, Operations with \$100,000+ Sales – 15-States: 2013

Million dollars



USDA-NASS
June 2014

Floriculture Census – 2005 Summary

Floriculture Crops

Top Five States by Value of Sales, 2005
For Operations with \$100,000+ Sales

Commodity	Rank	Value <i>(1,000 Dollars)</i>	1	2	3	4	5
			CA	FL	MI	TX	NY
Total Wholesale Value		5,083,421	988,788 19.4%	968,689 18.9%	866,994 17.2%	274,917 5.4%	177,686 3.5%
			CA	MI	TX	FL	NC
Annual Bedding Plants	1	1,804,821 37.5%	288,668 12.6%	188,867 8.6%	178,218 9.4%	142,468 7.6%	82,882 4.3%
			CA	FL	NY	TX	NC
Potted Flowering Plants	2	898,941 16.9%	188,269 24.6%	94,612 11.7%	49,880 6.1%	42,700 6.3%	89,481 4.9%
			FL	CA	TX	HI	NC
Foliage for Indoor or Patio Use	3	721,048 14.2%	488,668 68.3%	108,361 15.2%	18,867 2.8%	17,081 2.4%	6,818 1.0%
			CA	SC	MI	IL	NJ
Herbaceous Perennial Plants	4	708,306 13.9%	78,668 11.2%	63,196 8.9%	62,498 7.6%	40,088 6.7%	88,779 6.6%
			CA	FL	WA	HI	OR
Cut Flowers & Cut/Cultivated Greens	5	601,860 8.8%	288,820 57.6%	98,068 18.6%	18,716 3.7%	17,110 3.4%	8,867 2.0%

36 Surveyed States

USDA-NASS
April 2006

Floriculture Census – 2014 Summary

**Floriculture Crops
Top Five States by Wholesale Value of Sales, 2013
For Operations with \$100,000+ Sales**

Commodity (1000) dollars	Rank	1	2	3	4	5
		CA	FL	MI	TX	NC
All Floriculture Crops		1,130,523 27.0%	875,995 21.0%	393,650 9.0%	269,336 6.0%	235,647 6.0%
		CA	MI	TX	NC	OH
Bedding/Garden Plants	1	206,873 15.0%	216,024 16.0%	169,252 12.0%	135,916 10.0%	84,128 6.0%
		FL	CA	NC	TX	HI
Foliage Plants for Indoor or Patio Use	2	454,215 72.0%	109,609 17.0%	16,536 3.0%	12,978 2.0%	9,882 2.0%
		CA	FL	OH	TX	NC
Potted Flowering Plants	3	296,956 38.0%	168,785 22.0%	51,267 7.0%	31,705 4.0%	29,438 4.0%
		CA	SC	MI	OH	TX
Herbaceous Perennial Plants	4	92,168 15.0%	N/A	59,415 10.0%	47,797 8.0%	45,634 8.0%
		CA	FL	WA	NJ	OR
Cut Flowers & Cut Cultivated Greens	5	340,243 69.0%	65,043 13.0%	N/A	N/A	17,449 4.0%
		CA	MI	FL	NY	WA
Propagative Floriculture Materials	6	84,674 22.0%	75,191 19.0%	73,087 19.0%	25,592 7.0%	24,600 6.0%

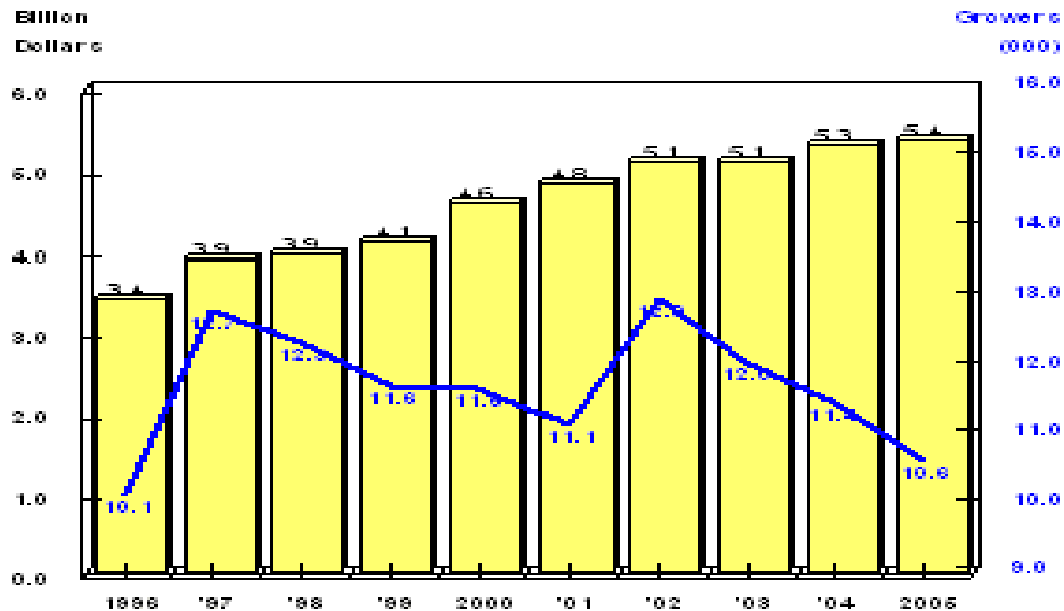
N/A- All or portion of data not published to avoid disclosing individual operations

USDA- NASS
June 2014

Floriculture Census – 2005 Summary

Floriculture Crops

Wholesale Value & Number of Growers, 1996-2005
Operations with \$10,000+ Sales



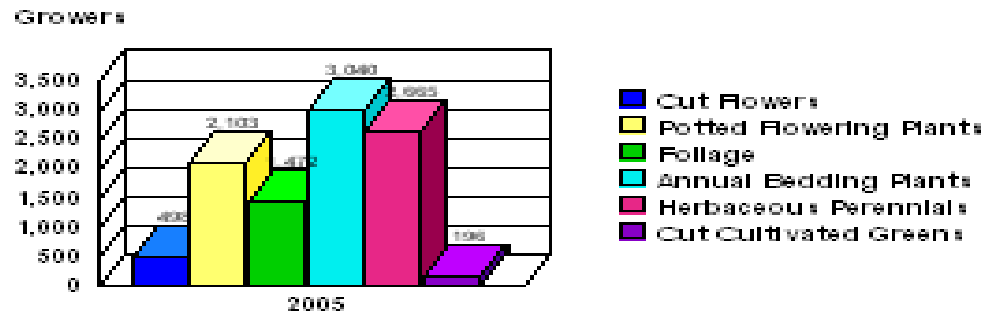
36 Surveyed States

USDA-NASS
April 2006

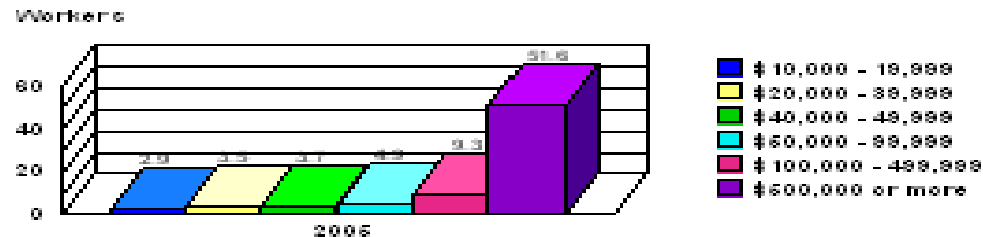
Floriculture Census – 2005 Summary

Floriculture Crops

Number of Growers by Type of Plant Produced, 2005
Operations with \$100,000+ Sales



Average Number of Hired Workers, 2005
by Size of Operation



Total number of operations with hired workers: 8,187

36 Surveyed States

USDA-NASS
April 2006

Best Sellers - Annuals

- ◆ **Impatiens
(hybrid & New
Guinea)**
- ◆ **Petunia**
- ◆ **Geranium (seed
& vegetative)**
- ◆ **Vinca**
- ◆ **Marigold**
- ◆ **Begonia**

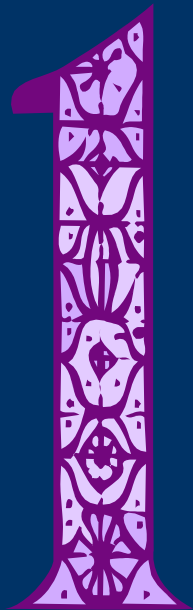


Best Sellers - Perennials

- ◆ **Rudbeckia**
- ◆ **Chrysanthemum**



Definitions



◆ **Annuals**

- **Complete life cycle in one growing season**
 - **Germinate, grow, bloom, go to seed all in one year**
- **Spinach, lettuce, petunia, pansy, and so on**

Definitions

◆ Biennials



- **Require two full years to complete their life cycle**
 - **Foliage and roots the first year**
 - **Flowers and seeds the second year**
 - **Then die**
- **Foxgloves, hollyhocks, forget-me-nots, etc.**

Definitions



◆ Perennials

- **Grow many years**
- **Includes**
 - **herbaceous plants**
 - **woody plants**
- **Thousands of species**
- **Many do well here**

Definitions



- ◆ **Hardy perennials**
 - **Live through winter**
- ◆ **Tender perennials**
 - **Must be lifted and stored until spring**

When to Plant



- ◆ **Know your growing season (10% chance <32F):**
 - **Powell - May 26**
 - **Torrington - May 31**
 - **Gillette - June 5**
 - **Casper - June 7**

- **Cheyenne - June 8**
- **Rock Springs - June 11**
- **Laramie - June 26**
- **Evanston - July 17**
- **Jackson - July 28**

Garden Design



- ◆ **Perennial garden very different from annual garden**
- ◆ **Annuals**
 - **splashes, masses of color**
 - **bloom all summer long**
- ◆ **Perennials**
 - **areas of intense color**
 - **different plants bloom at different times**

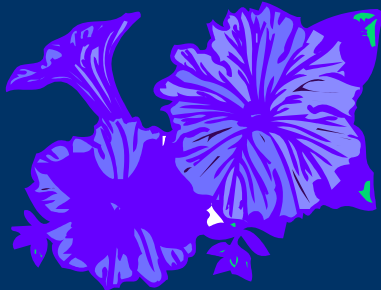
Annuals to Plant: Moist Spots



- ◆ **Ageratum**
- ◆ **Calendula**
- ◆ **Cleome**
- ◆ **Hibiscus**
- ◆ **Mimulus**
- ◆ **Pansy**
- ◆ **Torenia**

Annuals to Plant: Dry Spots

- ◆ **Alyssum**
- ◆ **Amaranthus**
- ◆ **Dusty miller**
- ◆ **Celosia**
- ◆ **Cleome**
- ◆ **Gazania**
- ◆ **Petunia**
- ◆ **Portulaca**
- ◆ **Salvia**
- ◆ **Vinca**
- ◆ **Zinnia**



Annuals to Plant: Hot Spots

◆ **Amaranthus**

◆ **Begonia**

◆ **Celosia**

◆ **Coleus**

◆ **Dahlia**

◆ **Dusty miller**

◆ **Gazania**

◆ **Gerbera**



◆ **Marigold**

◆ **Nicotiana**

◆ **Petunia**

◆ **Portulaca**

◆ **Salvia**

◆ **Verbena**

◆ **Vinca**

◆ **Zinnia**

Annuals to Plant: Cool Spots

- ◆ **Alyssum**
- ◆ **Alstroemeria**
- ◆ **Calendula**
- ◆ **Dianthus**
- ◆ **Dusty miller**
- ◆ **Flowering cabbage**
- ◆ **Flowering kale**
- ◆ **Osteospermum**
- ◆ **Pansy**
- ◆ **Primrose**
- ◆ **Salpiglossis**
- ◆ **Snapdragon**
- ◆ **Stock**



Annuals to Plant: Heavy Shade

- ◆ **Begonia**
- ◆ **Coleus**
- ◆ **Fuchsia**
- ◆ **Impatiens**
- ◆ **Mimulus**
- ◆ **Primrose**
- ◆ **Torenia**



Annuals to Plant: Light Shade

◆ **Ageratum**

◆ **Alyssum**

◆ **Dahlia**

◆ **Dianthus**

◆ **Dusty miller**



◆ **Lobelia**

◆ **Nicotiana**

◆ **Pansy**

◆ **Salvia**

◆ **Vinca**

Annuals to Plant: Heavy Soils

- ◆ **Ageratum**
- ◆ **Alyssum**
- ◆ **Dianthus**
- ◆ **Dusty miller**
- ◆ **Flowering cabbage**
- ◆ **Flowering kale**
- ◆ **Marigold**
- ◆ **Petunia**
- ◆ **Snapdragon**



Annuals to Plant: Baskets

- ◆ **Alyssum**
- ◆ **Begonia (tuberous)**
- ◆ **“Classic” zinnias**
- ◆ **Fuchsia**
- ◆ **Ivy geranium**
- ◆ **Lantana**
- ◆ **Lobelia**
- ◆ **Mimulus**
- ◆ **Nasturtium**
- ◆ **Petunia**
- ◆ **Portulaca**
- ◆ **Purslane**
- ◆ **Verbena**
- ◆ **Vinca vine**



Annuals to Plant: Fragrance



- ◆ **Alyssum**
- ◆ **Dianthus**
- ◆ **Heliotrope**
- ◆ **Pansy**
- ◆ **Stock**
- ◆ **Sweet pea**

Annuals to Plant: Cut Flowers

◆ **Alyssum**

◆ **Bachelor button**

◆ **Calendula**

◆ **Celosia**

◆ **Cleome**

◆ **Cosmos**

◆ **Dahlia**

◆ **Daisy**

◆ **Gerbera**



◆ **Lisianthus**

◆ **Marigold**

◆ **Grasses**

◆ **Salvia**

◆ **Snapdragon**

◆ **Stock**

◆ **Statice**

◆ **Sweet pea**

◆ **Zinnia**

Perennials to Plant: Sunny and Dry

- ◆ *Aurinia saxatilis* -
Basket of Gold
- ◆ *Penstemon strictus* -
Beardtongue
- ◆ *Gaillardia grandiflora* -
Blanket Flower
- ◆ *Coreopsis lanceolata* -
Coreopsis, Tickseed
- ◆ *Hemerocallis* - Daylilies
- ◆ *Linum perenne* - Flax
- ◆ *Iris germanica* - Iris
- ◆ *Papaver orientale* -
Oriental Poppy
- ◆ *Artemisia schmidtiana*
- Silvermound Sage
- ◆ *Sedum spectabile* -
Sedum
- ◆ *Sedum spurium* -
Sedum
- ◆ *Achillea
millefolium* -
Yarrow



Perennials to Plant: Sun to Part Shade, Moderate Moisture

- ◆ *Aster novi-belgii* - Aster
- ◆ *Rudbeckia* - Black-eyed Susan
- ◆ *Campanula carpatica* - Harebells
- ◆ *Aquilegia* - Columbine
- ◆ *Chrysanthemum x superbum* - Shasta Daisy
- ◆ *Delphinium elatum* - Delphinium
- ◆ *Geranium* - Geranium, Cranesbill
- ◆ *Vinca minor* - Periwinkle
- ◆ *Phlox subulata* - Creeping Phlox
- ◆ *Echinacea purpurea* - Purple Coneflower
- ◆ *Veronica spicata* - Speedwell



Perennials to Plant: Shady and Moist

- ◆ *Dicentra spectabilis*
- Bleeding Heart
- ◆ *Bergenia cordifolia* -
Bergenia,
Pigsqueak
- ◆ *Hosta* - Hosta,
Plantain Lily, Funkia



A Word of Caution



- ◆ **Two ornamental perennials are on the Wyoming noxious weed list**
 - *Lythrum salicaria* - Purple Loosestrife
 - *Chrysanthemum leucanthemum* - Oxeye Daisy
- ◆ **IT IS ILLEGAL TO PRODUCE, GROW, OR SELL THESE PLANTS IN WYOMING (AND MOST OTHER STATES)**

Tender Bulbs, Corms, Rhizomes to Plant

- ◆ **Gladiolus**
- ◆ **Some lilies**
- ◆ **Tuberous begonias**
- ◆ **Dahlias**
- ◆ **Cannas**



Tender Bulbs, Corms, Rhizomes to Plant

- ◆ **Must be dug in fall**
- ◆ **Not cold hardy**
- ◆ **Store in frost-free location**
 - **Slightly damp peat moss, perlite, vermiculite**
 - **Do not allow to dry out completely**



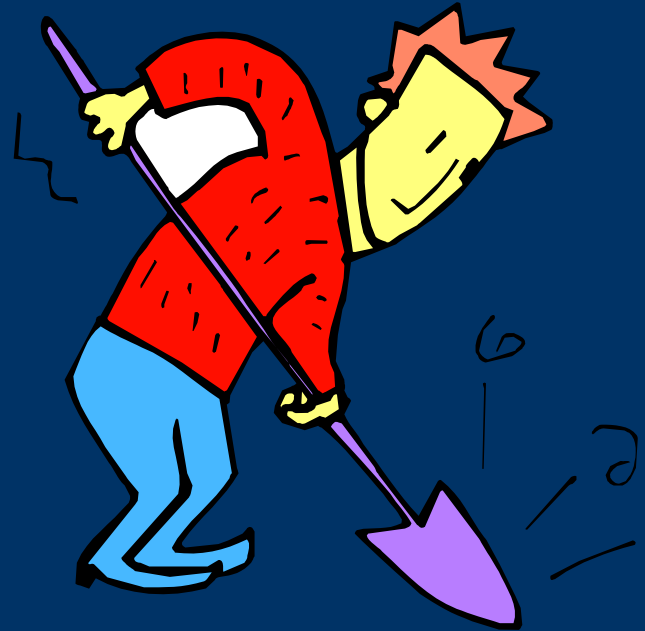
Hardy Bulbs, Corms, Rhizomes to Plant



- ◆ ***Crocus* sp. - Crocus**
- ◆ ***Tulipa* sp. - Tulips**
- ◆ ***Narcissus* sp. -
Daffodils, Jonquils**
- ◆ ***Hyacinthus
orientalis* -
Hyacinths**
- ◆ **Some *Lilium* - Lilies**

How to Plant: Bed Preparation

- ◆ **First eliminate weeds**
 - **By hand is best**
- ◆ **Then loosen soil**
 - **Double-digging recommended**
 - **Loosen soil 20 to 24" deep**
 - **Move top layer down one shovel depth**



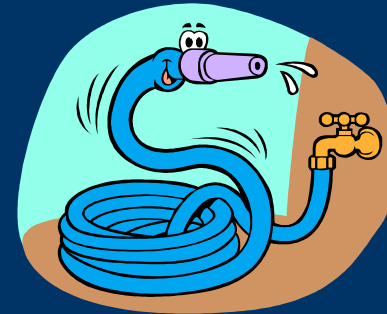
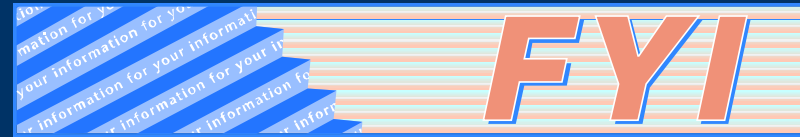
How to Plant: Bed Preparation

- ◆ **Poor soil - very clayey or sandy**
 - amend with good quality organic matter
 - one-third by volume
 - till or spade in
 - fertilize if needed



How to Plant: Ground Beds

- ◆ **Follow label recommendations for spacing**
 - Information should be on the label
- ◆ **Avoid planting too deeply**
- ◆ **Water in well**



Maintenance: Fertilizing

◆ Annuals

- **Grow quickly**
- **Regular fertilization may be needed**
- **Slow release types excellent**
- **Never add fertilizer to dry soil**
- **Soil testing will determine if needed**
- **Always water immediately after applying**



Maintenance: Fertilizing

◆ Perennials



- **New plantings may or may not need fertilizing**
 - Soil test will determine
- **Established plantings**
 - Slow release in spring
- **Late bloomers**
 - May benefit from summer fertilization
- **Always water immediately after applying**

Maintenance: Fertilizing



- ◆ **Bulbs, corms, rhizomes, etc.**
 - **Slow release at planting recommended**
 - **Avoid placing bulbs/corms/rhizomes directly on fertilizer**
 - **Spring fertilization best**

Maintenance: Weeding

- ◆ **Avoid herbicides**
- ◆ **Combination of hand weeding and mulching recommended**
- ◆ **Hoe lightly**



Maintenance: Watering



- ◆ **Most annuals require regular water**
 - Many very drought-tolerant
- ◆ **Perennials will vary in water use**
- ◆ **Bulbs/corms/rhizomes require regular water**

Maintenance: Watering

- ◆ **Group plants according to water needs**
- ◆ **Incorporate pre-plant organic matter**
- ◆ **Mulch**
- ◆ **Drip or soaker hose irrigation if possible**



Maintenance: Mulching

- ◆ **Highly recommended**
 - Especially organic types
 - Bark, sawdust, wood chips, compost, evergreen boughs, etc.
- ◆ **Apply spring and fall**



Maintenance: Mulching

- ◆ **Apply 2 to 3 inches thick**
- ◆ **Avoid contact with plant stems**
- ◆ **Do not cover plant crowns**



Maintenance: Mulching



◆ Inorganic mulches

- Do not break down over time
 - Gravel, landscape fabric, etc.
- Often covered with soil, plant debris, etc. over time
 - Defeats purpose

Maintenance: Staking

- ◆ **Tall perennials may need support**
 - Tall or floppy plants
 - Windy or exposed areas
- ◆ **Ready-made grates, bamboo stakes, etc.**



Maintenance: Staking

- ◆ **Height should be 6" lower than plants' ultimate height**
- ◆ **Put in early, when plants small**



Maintenance: Deadheading and Disbudding

◆ Deadheading

- Process of removing old flowers
 - Before they go to seed
 - Unless seed heads are of interest
- May increase bloom time
- Improves appearance



Maintenance: Deadheading and Disbudding



◆ Disbudding

- Removal of one or more flower buds
- Increases size of one(s) left on stem

Maintenance: Fall Cleanup

◆ Perennials

- Cut back dead stems

◆ Annuals

- Remove

◆ Tender bulbs/corms/ rhizomes

- Dig and store



Problem Solving: Normal Growth

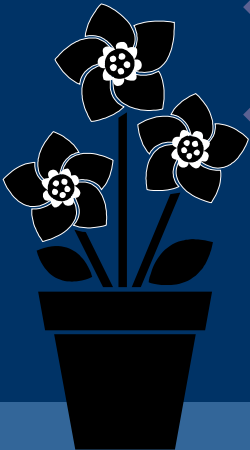


- ◆ **Look for healthy green foliage**
- ◆ **Avoid insect/disease damage**
- ◆ **White roots, rooted to bottom of container**
- ◆ **Properly cared for in retail setting**



Problem Solving: Normal Growth

- ◆ **Compact in container**
- ◆ **Bloom through growing season**
- ◆ **Variegated foliage?**
 - **May be normal**
- ◆ **Flowers true to type**
- ◆ **Label description important**
- ◆ **Trailing habit? Upright habit?**



Common Mistakes



- ◆ **Wrong spot**
- ◆ **Improper watering**
- ◆ **Improper fertilizing**
- ◆ **Planted too deeply**
- ◆ **Lack of soil amendments**

As a Master Gardener



- ◆ **NINE TIMES OUT OF TEN THE PRIMARY PROBLEM WILL BE EITHER CULTURAL OR ENVIRONMENTAL**

Tips: Annuals from Seed

- ◆ **Fresh seed**
- ◆ **Read the label!**
- ◆ **Follow package instructions**
- ◆ **Indoors about April 1**
- ◆ **Clean, light germinating mix**
- ◆ **Prepackaged mixes available**



Tips: Annuals from Seed

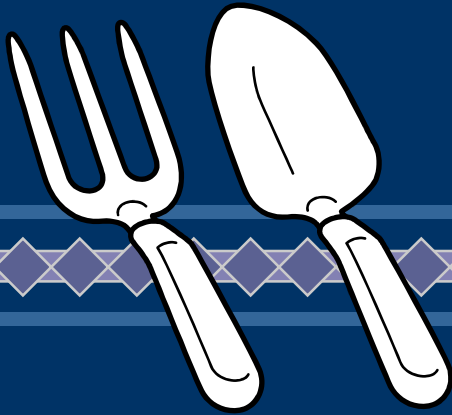


- ◆ **Soilless mix best**
- ◆ **Avoid over-watering**
- ◆ **After emergence, increase light**
- ◆ **Transplant at 2 - 3 true leaf stage**
- ◆ **Outdoors after frost danger past**

Tips: Perennials from Seed



- ◆ **Difficult in many cases**
- ◆ **Low germination rates**
- ◆ **Possible requirements for stratification, scarification**
- ◆ **Timing varies with species**



Transplants

- ◆ **For annuals or perennials**
 - **Often better option**
- ◆ **Healthy green foliage**
- ◆ **Avoid insect/disease problems**
- ◆ **White roots, rooted to bottom of container**
- ◆ **Properly cared for in retail setting**

Insect Problems

- ◆ **Cabbage worms**
- ◆ **Psyllids**
- ◆ **Hornworms**
- ◆ **Aphids**
- ◆ **Whiteflies**
- ◆ **Others (not insects)**
 - **slugs**
 - **spider mites**



Disease Problems



- ◆ **Smuts**
- ◆ **Rusts**
- ◆ **Blights/leaf spots**
- ◆ **Rots/damping off**
- ◆ **Wilts**
- ◆ **Mildews**
- ◆ **Viruses/
mycoplasma-like**

Avoiding Insect and Disease Problems

- ◆ **Space plants properly**
 - Good air circulation
- ◆ **Clean up litter and dead leaves, flowers**
 - Bag and toss or compost if healthy
- ◆ **Pull weeds**
 - Harbor many insects and diseases



Avoiding Insect and Disease Problems

- ◆ **Diversity in plantings**
 - Key
- ◆ **Use disease or insect resistant varieties if possible**
- ◆ **Have insects or diseases properly identified**



Containers: Annuals

- ◆ **Excellent for annuals**
- ◆ **Can move around**
- ◆ **Avoid heavy garden soils**
- ◆ **Require more attention to watering**



Containers: Perennials and Bulbs/Corms/Rhizomes

- ◆ **Also excellent for perennials**
- ◆ **Winter care critical**
 - water
 - shelter
- ◆ **Movable**
- ◆ **Avoid heavy garden soil**

